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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,483	01/28/2002	Zeev Smilansky	2786-0203P	5637
2292	7590	03/17/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			HUNG, YUBIN	
		ART UNIT	PAPER NUMBER	2625
DATE MAILED: 03/17/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/056,483	SMILANSKY, ZEEV	
	<b>Examiner</b>	<b>Art Unit</b>	
	Yubin Hung	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-22 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-22 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 28 January 2002 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### *Oath/Declaration*

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR 1.55, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

Specifically, the date of Israel application No. 141151, January **29**, 2001, as appeared on the Declaration is inconsistent with that on the submitted Israel application document, which indicates an application date of January **28**, 2001.

### *Drawings*

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the operating steps (e.g., in the form of a flow chart) of the claimed method (e.g., as embodied in claims 1, 9 and 13) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The abstract of the disclosure is objected to because it contains two paragraphs. Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 9-13 and 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al. (US 6,826,363).

6. Regarding claim 1, and similarly claims 9, 13 and 17-22, Brown discloses

- a) associating to each of a plurality of pixels  $x_i$  in the first array a pixel  $T(x_i)$  in the second array and  
b) applying a linear regression analysis to the ordered pairs of numbers  $(x_i, T(x_i))$  so as to produce a slope  
[Col. 2, line 29-Col. 3, line 23, especially Col. 3, lines 15-23. Note that the 1<sup>st</sup> array of signals is  $\{r_m\}$  and the 2<sup>nd</sup> array is  $\{g_m\}$ , both consisting of measured fluorescent intensities and that R (in Equation 6) is the slope to be determined by the least squares fit (a form of linear regression). Further note that since identical index (m) is used, it follows that  $T(x_i) = x_i$ .]

In addition, column 2, lines 7-10 of Brown indicates an image acquisition step that is recited in claims 9 and 13, respectively, as an additional limitation. Further note that since the method of claim 1 is for linear regression on image signals, it is also applicable to images of differential gene expression and of differential protein expression (each express has corresponding image signals)

7. Regarding claim 2, and similarly claim 10, per the analysis of claim 1 Brown also discloses that

$$T(x_i) = x_i.$$

Art Unit: 2625

8. Regarding claims 3 and 4, and similarly claims 11 and 12, Brown further discloses

- (claim 3) the first and second signal arrays are obtained by incubating a DNA chip in the presence of first and second probe species, the first probe species producing a signal that is distinguishable from a signal produced by the second probe species
  - (claim 4) the first and second signal arrays are obtained by staining a spot in separation pattern with first and second labels, the first label producing a signal that is distinguishable from a signal produced by the second label
- [Col. 2, lines 10-40. Note that the staining is by using either red or green fluorescence, with red and green being the two labels]

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown (US 6,826,363) as applied to claims 1-4 above, and further in view of Rosenfeld et al. (Digital Picture Processing, 2<sup>nd</sup> ed., 1982, pp. 23 & 46-48).

11. Regarding claim 5 , and similarly claim 14, Brown discloses all limitations of its parent, claim 1.

Brown does not expressly disclose

Art Unit: 2625

- the first and second arrays are not superimposed

However, Rosenfeld suggests a method of correlating two arrays without superimposing them. [P. 47, 3<sup>rd</sup> paragraph – P. 48, 1st paragraph. Note that the matching techniques discussed register corresponding pixels and define coordinate transformations from one pattern to another. Sect. 9.2 on page 23 discusses general scene registration.]

Rosenfeld is combinable with Brown because they both have aspects that are from the field of endeavor of pattern matching.

At the time of the invention, it would have been obvious to one of ordinary skill in the field to modify Brown with the teaching of Rosenfeld by not superimposing the arrays being analyzed as well as to register the patterns to be matched. The motivation would have been because distortion can be expected and therefore the patterns to be matched cannot be expected to be identical.

Therefore, it would have been obvious to combine Rosenfeld with Brown to obtain the inventions of claim 5.

12. Regarding claim 6, and similarly claim 15, Brown further discloses

- the first and second signal arrays are spots in a first and second separation patterns, respectively  
[Per the analysis of claim 4]

13. Regarding claim 7, and similarly claim 16, Rosenfeld further teaches/suggests

- the first and second separation patterns are in register, and for each pixel  $xi$  in the first spot,  $T(xi)$  is the spot in the second separation pattern in register with  $xi$   
[Per the analysis of claim 5]

14. Regarding claim 8, since the methods of claims 1-7 are for linear regression on image signals, they are applicable to images of differential gene expression and of differential protein expression.

***Conclusion and Contact Information***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Levine et al. (US 6,489,096) – discloses a quantitative analysis of hybridization patterns using linear regression
- Bao et al. (US 6,251,601) – discloses a method that applies linear regression to two sets of DNA ratio data
- Gilchrist et al. (US 5,916,747) – discloses a method for aligning (i.e., registering) multiple sets of signals for use in DNA based-calling
- Li et al. (US 6,571,005) – discloses a method to relate two expression arrays of the same probes

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung  
Patent Examiner  
March 15, 2005



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